

DISEASES

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Editorial Comment

Ash Trays In restaurants and private homes, where no one uses a soiled spoon or common drinking glass, the table ash tray is merely dusted off, after being contaminated by sputum or saliva soaked cigarettes or cigars from person after person, in rapid succession, especially in the restaurants. Sterilization of ash trays in restaurants between users would probably do much to lessen the spread of epidemic diseases. Boiling of ash trays in the home would lessen the chance of the casual caller leaving some infectious germs in a dangerous place.

Tuberculosis depends for two-thirds of its spread upon just such loopholes in cleanliness. The other third of the cases can be traced to known contact with a known infectious case.

Lieutenant Colonel Arthur Parker Hitchens, head of the School of Public Health of the University of Pennsylvania, who has been stimulating study of the sterilization of drinking glasses, and Dr. Robert S. Breed, Chief of the Division of Bacteriology of the New York State Agricultural Experiment Station at Geneva, N. Y., who has been interested in the cleanliness of food containers, and other experts in the public health field, may be interested in this subject from an experi-

mental viewpoint to prove our assumption.

F. W. B.

A Further Thought As pointed out in a very strong editorial by Dr. Frank Burge in the July issue of *Diseases of the Chest*, a competent roentgenographic survey of the fighting forces of Uncle Sam will be essential, in the preparedness program of this country. It will be essential if the errors of the World War are not to be repeated. These errors permitted the enlistment of many active, or potentially active, cases of tuberculosis in the army; and there followed a resulting break-down in the health of these individuals and a further dissemination of their disease to their comrades. This has cost, and is continuing to cost, our government many millions of dollars.

It is now well known that the best, and in many instances the only, way to determine these early active, or potentially active, cases is by the x-ray examination. This situation, therefore, demands the x-ray examination of all recruits and also a competent interpretation of the x-ray films. This latter is extremely important and imposes upon the examiner not only a knowledge of roentgenography, but a definite knowledge of the evolution, pathogenesis and prognosis of tu-

berculosis. In this connection, the excellent articles of Dr. Leopold Brahdy of New York City are to be highly recommended. Dr. Brahdy very clearly and comprehensively discusses the problem of the primary lesion as it factors in roentgenographic surveys.

The differentiation of these primary infection lesions from the significantly important early re-infection lesions may be very difficult; but a failure to make proper differentiation may result in grievous error. The recorded results of previous tuberculin tests on individuals under question offer considerable aid. A previously recorded positive tuberculin reaction greatly simplifies the issue in that the lesion almost automatically falls into the re-infection group. Dr. Brahdy emphasizes, therefore, the importance, or rather the necessity, of combining periodic tuberculin tests with roentgen case-finding, in adults. The writer feels that this point should be stressed in view of the tendency to minimize the value of tuberculin testing of adults, particularly in the metropolitan areas.

C. H. H.

Past and Present "The Captain of Men of Death" had been the title, which until fifteen years ago was reserved for tuberculosis. Until that time, as far back as history dates, tuberculosis had caused more deaths than any one single disease. More recently, however, due to the marked inroads that scientific medicine and public health procedure have made in combating infectious diseases, there has been a notable decrease, not only in the mortality from tuberculosis, but also in the mortality arising from other bacillary diseases. This has resulted in an increase in the average span of life in this country. Twenty-five years ago, the average length of life was approximately forty-eight years; it now is fifty-nine years in these United States of America.

Supplanting those diseases which previously stood in the forefront of our mortality tables, have come a group of conditions termed degenerative diseases. These affect principally the vascular channels, which include the heart, the blood vessels, and the kidneys. While the problems involved in the study and research of these varying pathological conditions have proven very intriguing, they have not as yet yielded much beneficial

information. Especially has the condition termed hypertension, either as an essential condition, or as the end result of pathologic changes in the vascular system, remained somewhat of an enigma. For many years, there have been a host of therapeutic agents used empirically in the management of these conditions. Among these agents, clinical observation has noted benefit from the utilization of concentrated garlic extract in the management of certain hypertensive states. Research is, at this time, being carried on, utilizing such garlic extract, and within the next several months the results will appear in the medical literature. Our present knowledge of this research dictates that certain benefits in some types of hypertension have been recorded in the study of this problem and we, therefore, call to the attention of our readers this new form of therapy.

B. G.

"Information Please!"

A most attractive innovation was made in the program at the recent annual meeting of the American College of Chest Physicians in New York City; and an innovation that time should see crystalized into an enduring permanentcy. This was the "Information Please" luncheon.

Questions formulated and sent in by members were submitted to a group of "experts". The answers were not rehearsed; but were given in the wholesome spirit of spontaneity. For each of the two luncheons, a different group of "experts" were seated upon the raised platform. They were chosen from the ranks of those who have become outstanding in their specialty. Thoracic surgeons, clinicians, roentgenologists, pathologists, bronchoscopists, etc., were represented among them.

The lovely Bowman room of the Hotel Biltmore furnished the attractive setting for these luncheons, and this spacious room was well filled on the occasions. A microphone and loud speaker hook-up made the reading of the questions by the master of ceremonies and the answers by the expert clearly audible to everyone.

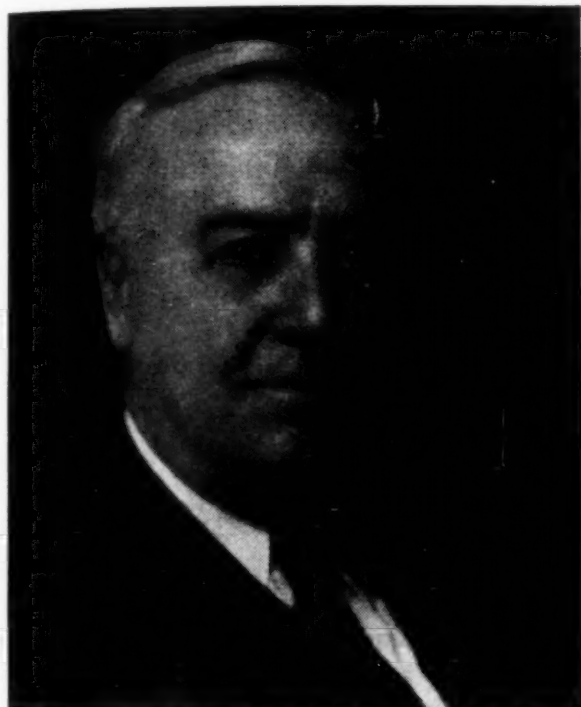
Think up a question for "Information Please" at the next annual meeting in Cleveland. You have a whole year in which to do so.

C. H. H.

Address of the Incoming President*

The College Advances Toward Objectives

JOHN H. PECK, M.D., F.A.C.C.P.
Oakdale, Iowa



To stand here before you, and make the statement usual in such instances, that one is deeply honored, and appreciative of the honor, is but froth in the cup. What really counts is the intent and the ability to demonstrate that the honor is not unwisely bestowed. Of my intent to prove worthy, I hope there is little doubt in your minds. Of my ability to foster and to further promulgate the aims of the College so capably defined by my predecessors, I myself have more doubts than any of you can realize, except those who also have suffered the trepidation I feel in dedicating myself to the interests for which the American College of Chest Physicians stands. As a man small in stature may rise to great heights in achievement, so the man to whom nature has ordained more massive contours may fail in achieving his goal. I beg you to take into consideration the limitations of which I am only too well aware,

and to extend me all the assistance and encouragement possible. I shall need it.

An incoming president has little of his own accomplishments to present, but he can and properly should, acknowledge the debt he owes to those who have preceded him and set him an example, and he can pledge his energy to holding intact what already has been gained and proven worthy, and to make as much further progress as his limitations and support allow.

The value of preparedness is being thrust upon our notice daily. We Fellows of the College should be alert to the dangers of dalliance and be actively interested in promoting the interest of the general practitioner in chest diseases, not because chest diseases are the only menace, but because they have a way of sneaking up and striking when least expected. The need for foresightedness, for establishing bulwarks of defence and prevention, is no less great because we are fighting disease than it would be if we were attempting to hold off a gigantic war tank rolling steadily toward us. Indeed, concerted action in all forms of medical work is of greater importance than ever before. Who knows into what terrific cataclysm the medical profession may be plunged before another year. Now, before any crises, other than those always present, are before us, we need more than ever to stand shoulder to shoulder.

Without decrying the immense value of the social aspects of tuberculosis treatment, one must admit the value of science. We need look backward but a few years to recall the contributions which have been made through scientific study and research. It is my wish that the committee for the advancement of scientific programs in organized medicine should stimulate establishment of a section on chest diseases in the American Medical Association, to the end that those who are engrossed in their routine work may know what is being done, and be ready to utilize any new thing which is proffered bearing the

* Sixth Annual Meeting, American College of Chest Physicians, New York City, June 8-10, 1940.

stamp of approval. This section on chest diseases could well include cardiology. A fine start has been made this year and we all are proud that an excellent symposium will be given in the Section on Medicine Wednesday afternoon. I am sure that this method of reaching the practitioner is more valuable than discussion of similar phases of tuberculosis within our own organization.

Through the committee on advancement of tuberculosis organization in medicine there has been, during the past year or two, talk and effort designed to complete a more compact tuberculosis organization, to the end that efforts may be more concentrated and results more rapidly obtained. There can be but one worthy object in organization and that is an objective toward the eradication of disease and the subsequent well-being of humanity. There should be, I believe, a well organized committee on tuberculosis in every state, affiliated with the State Medical Society and through it extending to every County Society and every individual member.

We should continue to raise standards for Fellowship in the College, not to make it more difficult for entrance, but to insure the best timber. Nor should we wait until a doctor has achieved prominence to attempt to interest him in the importance and study of chest diseases. This seeming paradox may be worked out by encouraging young doctors to become interested in the College by associate-ships. This, of course, must be approved by amendment to the constitution and by-laws, after which suitable machinery must be set up to carry out these advances. The college must not be static.

The circulation of our journal, *Diseases of the Chest*, though past the 10,000 copies monthly, is not enough. Every general practitioner should have this Journal. Suggestion has been made that this increased circulation be financed through formation of a women's auxiliary to the American College of Chest Physicians, which auxiliary would carry the burden of this distribution, and further suggestion was made that the Chairman of the Board of Regents and Editor of the Journal might withdraw from these offices and devote himself to the task of organizing this auxiliary. It is requested that Fellows give the matter serious thought and express their

sentiments to the Chairman of the Editorial Board. We hope to have some definite opinions to consider.

Another method for interesting the general practitioner in diseases of the chest was suggested by Dr. Goldberg, viz: having standardized papers on tuberculosis which would be read at local societies and which would be distributed to the general practitioner. Preparation and distribution of such papers would be a part of the duties of the state and county tuberculosis committees.

It should be an objective of the sanatorium committee to raise the standards of sanatorium care, no matter how good they already are, and since sanatorium care is impossible for many, to make it possible for the private physician to care for the private case with benefit to both. The question of industrial insurance should be more fully developed to the end that as large a proportion of the population be medically self-supporting as possible. This committee can well be enlarged. It is also my hope that all sanatoria be rated or approved by competent authority, not as general hospitals, but as sanatoria, which rating must of necessity vary greatly in some respects from that of the general hospital where patients remain but a short time, and yet all facilities of value to the patient in a general hospital be available to the sanatorium patient.

To the statistical committee falls the duty of keeping in touch with all efforts toward the eradication of pulmonary and other chest diseases, and to make the results available in such form that quick and accurate comprehension is possible. They say nothing is drier than statistics. Too often this is true, but it need not be so. More complete statistics should be had on the forms of chest surgery, on buildings, housing, salaries, rehabilitation—occupational, vocational, and educational. The recent questionnaire covers these questions very satisfactorily, and the information thus obtained will be useful when fully analyzed.

I have reviewed to some extent already the aims and objectives of the American College of Chest Physicians, and now I would like to stress most emphatically my belief in one of the College's projects—the teaching of diseases of the chest through medical schools. There is little, if anything, that can be added

to Dr. Hayes' fine presentation of this subject this morning, but I would like to speak briefly on what is being done in Iowa.

Because of the proximity of the State Sanatorium to the Iowa State Medical College there is an enviable opportunity in Iowa for medical students to become tuberculosis conscious, to have first-hand training in pulmonary tuberculosis. As a supplement to the medical routine of our Medical College, senior medical students are required to spend two weeks in actual residence at the State Sanatorium. They are assigned clinical clerkships under the staff physicians. They accompany him on his rounds; they see the patient for taking history, diagnosis, bedside care; they hear the case discussed at staff meetings; they are given demonstrations of the importance of the laboratory, the x-ray, the social service, the rehabilitation, vocational and educational side of the tuberculous patient's problems. They see the patient not as Case No. so and so, but as John Smith, or Mary Jones, who may some day be sitting in their offices, wondering what ails them, and expecting to find out. He sees the patient as a part of the community, a part which must be strengthened lest the community weaken—a chain is no stronger than its weakest link—and there are still too many tuberculosis links, in spite of pneumothorax, phrenics, pneumoperitoneum, bronchoscopy, etc. Some authorities claim that the death rate per tuberculous patient is as great as it was twenty or twenty-five years ago. This may be open to question, but there is still sufficient tuberculosis to demand that the newly graduated physician should be prepared to see it lurking behind the masks of bronchitis, asthma, nervous exhaustion, or any of the hundred and one masks it assumes. It is not enough that those of us with ten, twenty, thirty years of experience behind us, know how to pull off the mask. Those who are going to follow us must know more than we did when we started out, and more than we know now.

Years ago a poet wrote:

"I shot an arrow into the air,
It fell to earth, I know not where."

He goes on to say that years afterward he found the arrow, still unbroken. Well and

culosis and other chest diseases, we must have not only the arrows, but we must know what we are shooting at. We, the older men, must see that the medical student is an arrow. We must shoot him in the right direction, and we must see that he, in turn, has arrows to shoot and knows what to shoot at.

So I would like to see, during my incumbency, still greater stress placed on the education of the medical student in the fundamentals of tuberculosis. That this will be difficult, I know. That it is not impossible, I know. That it is desirable, I know. It is the general practitioner who gets the patient first. Therefore, if all the newly practicing general practitioners had practical training in tuberculosis in addition to their academic courses, even though only of two weeks duration, I see earlier diagnoses, a better understanding of the problems of the tuberculous and their importance to the community, and a wider knowledge of what can be done in addition to the time honored remedies of rest, food and fresh air. I urge every one among you to use his influence toward better education of the medical student in tuberculosis.

Also I would like to see greater stress placed on the rehabilitation of the tuberculous. Agreeing that the sanatorium is not the ideal place for rehabilitation, yet it well can be the beginning. We can grant that a patient strictly on the cure, seeing nothing, hearing nothing, doing nothing, encased in a splint, so to speak, can get well sooner than one whose make-up does not let him relax to this extent, but how many such patients are there? Better delay results a little, if by so doing we can persuade the patient to remain long enough to achieve an arrest, rather than let his weaknesses take him away where he will become more and more a problem to the community. Rehabilitation outside of the sanatorium, yes, as rapidly as it can be accomplished, but such rehabilitation centers are as few as the patients who can go into coma when they enter a sanatorium and remain there until arrested. In the mean time, use the sanatorium for a testing-out place, even though little by little. We go *even further*. We have at present 68 former patients working full time, and six working part time. It is reasonable to suppose that these patients, if they had been discharged to work out their

good, but in our efforts to stamp out tuberculosis outside the sanatorium, would soon be thrust back into the sanatorium with almost total loss of what already had been accomplished. I might add that the average length of stay of our ex-patient employees is five years. Those who leave then are usually well equipped to hold their own outside of sheltered employment.

I realize that rehabilitation of the tuberculous is not the prime object of the College, but if we do not teach the necessity of rehabilitation of the tuberculous as well as the diagnosis and treatment, then we are missing something mighty important.

Much work has been done by the College

during the past year, and much remains to be done. I was not fully aware of the extent and scope of the various committees of the College until recently. Looking over these committees and the objects for which they stand, I have been duly impressed. With the appointment of new members to various duties, I commend the efforts of their predecessors, and urge a still higher point of achievement for the incoming members.

At the beginning of my talk I asked for your assistance and encouragement. I now ask your tolerance for the things left unsaid which should have been said, and I ask for your active good will in my efforts to uphold the fine tradition already established.

A General View of Tuberculosis in Alaska

A. HOLMES JOHNSON, M.D., F.A.C.C.P.
Kodiak, Alaska

Working on the proved assumption that, where an intensive community campaign against tuberculosis has been tried, the death rate from and the incidence of the disease has been definitely lowered, the Alaska Territorial Department of Health, through its Department of Communicable Disease Control, has, with additional funds from the United States Public Health Service, lately begun such an intensive program.

In addition to the two full-time physicians of the Department of Communicable Disease Control, including the Tuberculosis Clinician, the Department of Health has eleven Public Health nurses in the Territory who are assisting in this work. The Office of Indian Affairs has doctors in charge of their seven hospitals and a number of Field Nurses in the more isolated districts who are cognizant of the program; the local Health Officers and independent physicians are also fully in sympathy with it.

Case records from these various sources, and school examination follow-ups, are kept on file in Juneau. X-rays taken periodically, wherever possible, are compared to the plates of the previous year and the report included in the record.

The need for as complete and intensive a

program as possible against tuberculosis can readily be understood from a few figures:

When the death rate in the United States from the disease was 48.9 per 100,000 (in 1938), the death rate in Alaska was 358 per 100,000. In 1937, it was 423 in Alaska against 53.8 in the United States; in 1936, 437 against 55.7, and in 1935, 491 in Alaska against 55 in the United States. This, in comparison, is a tremendous difference. For comparison with the colored population of the United States, the death rate thereof, in 1932, (only figure available) was 171.9 per 100,000.

Of course, it is the native people of Alaska who account for this large death rate as shown by the fact that, in 1936 for instance, the death rate per 100,000 was 794 for the native against 63 for the white population. This figure should be somewhat higher for the Whites, as many of this class go "Outside" to a Sanatorium and their death is not allocated back to Alaska; the figure should be lower for the Natives because of the tendency to give tuberculosis as the cause of death in all obscure cases. Often, in remote villages, death certificates have to be made out by the local trader or other person little qualified for the task.

Tuberculosis takes the lead, in Alaska, as

the cause of death. Actual deaths from tuberculosis in 1937 were 254. The next most lethal were diseases of the heart with 194 deaths, followed by accidental deaths set at 123. In 1938 there were 215 deaths from tuberculosis, 161 from Heart Disease and 90 Accidental. In that year Pneumonia was rampant and came next to Heart Disease with 114 deaths.

Taking the Fremington Ratio of nine active cases needing immediate treatment for each annual death, the number of such cases in Alaska would be 162 Whites and 2,142 Natives. Doubling these figures would approximate the total incidence of the disease, or 324 Whites and 4,284 Indians.

Most of the statistics given above are from a reprint by the former Territorial Epidemiologist, J. A. Carswell, M.D.,* plus later figures from the present incumbent, Dr. Burton L. Zinnamon, and checked by the Tuberculosis Clinician, Dr. Palmer Congdon, but all admit that the figures are far from adequate because of the lack of official reports.

It will be interesting to note that the figures are based on the 1930 census which gives the total White population of Alaska as approximately 29,000, and the total Indian population (including Eskimos) as 30,000. The 1940 census will doubtless see an increase in the White population.

In attacking this great problem in Alaska, the first effort of the Health Department is to discover every individual with an Active Tuberculosis. This is being done through reports from the various agencies above mentioned, assisted by x-rays taken by the Tuberculosis Clinician wherever possible. (These are taken on a portable x-ray machine wherever there is an available alternating current electric plant, even in remote districts far from hospitals).

The second effort of the Health Department is the segregation of these active cases in order to prevent contacts with them of healthy individuals until by treatment—rest, pneumothorax or other surgical measure—they are made inactive. This segregation and isolation is the most difficult part of the program and more will be said about it later.

The third effort is the investigation of all

contacts with active cases, and the effort to gain their isolation, if they prove to be a potential danger, until x-rays show healed lesions. This effort is particularly valuable in discovering early cases before they have had time to spread much infection, and in educating them in the precautions they must take to safeguard others. Toward this third effort the Tuberculosis Clinician, in his travels through the Territory, takes x-rays of all Tuberculin Positives of any age, and of all who are known to have been in contact with an active case, as well as of any other individual who has symptoms referable to the chest or other tuberculous focus, whether referred by a doctor or nurse, or presenting themselves because of their symptoms.

Pre-school examinations, as well as annual examinations of students, are made as extensively as possible throughout the Territory. Constant education is promulgated by the various health agencies and the school teachers as well as by the Alaska Tuberculosis Association.

As stated above, the segregation of active cases is the most difficult part of the program. Families among the Native population are often large, frequently living together in one small room, often sleeping in the same bed.

At present there are no funds for a Territorial Sanatorium, so that the few cases for which funds are available, are sent to hospitals in Seattle and paid for by the Territorial Department of Public Welfare. Funds, at present, are available for forty cases. In addition, there may be a total of sixty beds that can be used for tuberculosis in the Office of Indian Affairs hospitals. It can readily be seen that the great majority of active cases must be cared for outside of institutional management and, with the crowded conditions in the homes, the difficulty of segregation can be realized. Under such conditions, even highly educated persons would have difficulty in keeping dishes segregated and sterilized, caring for the sputum, keeping other members of the family, and friends, away from the beloved patient, and to expect this care in the average Native household is an almost impossible hope.

These Native peoples are a happy lot—one might say, "happy-go-lucky". They have a great sense of humor. When they are in health nothing can worry them. Consequent-

* Poverty and Tuberculosis with Particular Reference to the Economic and Social Significance of High Death Rates Among Alaskans.

ly, no matter how serious an aspect the doctor puts on the condition, the tuberculous patient, as soon as he has recovered from his more distressing symptoms and is beginning to feel better, regardless of multiple warnings, unvaryingly gets up and about, goes to the dances in which he so much delights—and returns to bed with an extension of the infection. That this experience means nothing to him is indicated by the fact that, as soon as he again begins to feel better, he again gets up and about, this time trying to avoid meeting the doctor on the street, and continues this course of action until he succumbs or, occasionally, recovers.

Of course, if measles intervene in the course of the above, exitus seems fairly sure and rapid. Following an epidemic of measles last year, although all active cases prior to the epidemic were progressing nicely, with temperatures approaching normal, cough abating, etc., after an attack of measles, every case which was at all advanced immediately flared up and all were dead within three to six months except one who is in a serious condition in the Portland (Oregon) Open Air Sanatorium. Other cases became recognizable after an attack and are now running a stormy course. The seriousness of measles in tuberculosis had never before been so thrust upon my attention.

Bovine sources can almost be excluded among Alaskan Natives as, with remarkably few exceptions, all Native children are brought up either on the breast, or on evaporated milk. In addition, most of the cows of the Territory are tested annually by the Territorial Veterinarian and positive reactors separated from the herds. All cattle shipped into the Territory must be tested and all tuberculin positives excluded.

This is rather interesting in view of the fact that we have a large percentage of bone tuberculosis among children, which is commonly thought of as originating in the Bovine form. Our bone tuberculosis must, therefore, be from human contact. As pointed out by Dr. Hays, of the Crippled Children's Service, bone tuberculosis is usually considered an indolent type of the disease and would be expected more among a people with an immunity to the disease, whereas a more acute reinfection pulmonary type would be expected in primitive peoples.

However, x-rays taken among the Native population, interpreted by Dr. Carswell, show that there is a large percentage of healed tuberculosis among the Natives, and he draws the conclusion that the Native has an almost equal natural resistance to the disease as the White person.

Therefore, the conclusion to draw is that inasmuch as the large death rate among the Natives is not due primarily to their lack of immunity, it must be due to their living conditions.

The average income for Alaskan Natives, derived chiefly from fishing and trapping, is not over five hundred dollars and, as large families are the rule, it can readily be seen that under-nourishment would be expected. This is augmented by the fact that, as the Alaskan Native is an American Citizen (not a Reservation Indian), he is permitted to purchase alcoholic beverages and is prone to use them to excess, thus cutting down his small allotment for essential foods as well as lowering his resistance by the excessive use of alcohol.

The chief reason, however, for the prevalence of the disease, it would seem, is the close contacts of everyday life due to overcrowding. Perhaps most of the Natives live in one or two rooms where several may sleep in the same bed. In the cold country, in order to conserve heat, the Eskimo builds an igloo just large enough to contain his family, often with roof too low to permit standing upright and here they eat, sleep and live. It is a commentary on their natural resistance that an even larger percentage do not have an active form of the disease. Even if a doctor or a nurse gets into the district and makes a diagnosis of tuberculosis, he cannot, due to the Natives economic status, and the lack of an institution to which to send them without charge, do very much about isolation of the patient.

This brings us to the outstanding need of Alaska in combatting tuberculosis, namely, Sanatoria. These should be at least two in number, one for the Whites and one for the Natives, with a bed capacity equal to at least the number of deaths per annum. In this way the disease would be gradually lessened. If a half million dollars a year were available so that all active cases could be isolated, tuberculosis would be made to take its place with Typhoid Fever and other controlled dis-

eases in a generation.

An interesting study on the value of B. C. G. vaccine is being made in a portion of South-eastern Alaska by the Phipps Institute of Philadelphia with the cooperation of the Office of Indian Affairs. This is a five year study started in the fall of 1937, and includes tuberculin testing and x-raying a considerable number of the Native population in this district, followed by giving one-half of the tuberculin negative children the vaccine, using the other half as controls. Dr. J. F. Worley, in *The Health Officer* for last October, reported on the x-ray findings thus far in the study. He states, "Of 3,000 x-ray examinations, 1 per cent showed childhood type of infection; 11.9 per cent, calcified primary lesions; 5.8 per cent, latent apical lesions; 3 per cent, minimal; 1.7 per cent, moderately advanced; and 1.6 per cent, far advanced pulmonary tuberculosis. Thus," Dr. Worley continues, "something less than six per cent of this group has active pulmonary tubercu-

losis, but a total of twenty-five per cent shows x-ray evidence of past or present tuberculosis infection. It is interesting to note that this tallies very well with other findings throughout the Territory.

"Although these proportions seem discouraging, Dr. Aronson recently stated that in comparison with tabulation of 3,597 white persons in the mountains of Tennessee, the incidence of tuberculosis in this group is conspicuously higher than among the Indians of Southeastern Alaska. He also states that the incidence among these Alaskan Natives is very similar to that found in a survey which he made in the slums of Philadelphia."

Thanks to the various Health Agencies in the Federal Government and in the Territory, more funds are being found for this important work so that, if increased funds continue, the next few years should see a definite result from the more intensive work made possible by this increased program.

Griffin Memorial Hospital.

Broncholithiasis

DAN W. MYERS, M.D., F.A.C.C.P.
St. Louis, Missouri

Localized calcareous deposits in the lung parenchyma or tracheobronchial lymph glands result from the natural tendency to the deposition of calcium at sites of tissue injury. In the vast majority of cases such intrapulmonary and intraglandular calcifications are a residual of the first infection type of tuberculosis. Less frequently, other forms of inflammatory disease may be responsible, and on occasion stony concretions may develop within bronchiectatic or pulmonary cavities as a consequence of precipitation of lime salts around a cellular or particulate nucleus. Diffuse reticulated deposition of calcium in the alveolar walls, a rare occurrence associated with states of hypercalcemia, presents a distinctive appearance, but does not produce the clinical syndrome of broncholithiasis.

Experienced physicians recognize the great frequency with which calcified foci may be demonstrated in roentgenograms of the chests of healthy adults, and it is generally conceded that these concretions do not by them-

selves constitute evidence of active pulmonary disease. Migration of a calcareous mass into a bronchial lumen may, however, produce clinical symptoms. While this occurrence (broncholithiasis) is not common in proportion to the number of patients exhibiting calcifications, it occurs with such frequency as to demand recognition as a distinct clinical entity. The symptoms observed are correlated either with pressure ulceration of the bronchial wall or with the sequelae of partial or complete bronchial obstruction.

A positive diagnosis demands the visualization of a calculus either through the bronchoscope or in the sputum. Bronchololiths are customarily white in color; they may be hard and gritty, or soft and putty-like in consistency. The medical history of patients with chest disease should always include inquiry concerning the expectoration of calcified bodies. It is our habit to pose the following question, "Have you ever spat up anything of unusual nature such as stones or gravel?" One should, of course, be wary of the natural

desire to grasp at such a convenient explanation for all the signs and symptoms manifested by the patient. Although the expectoration of a stone suggests its responsibility for an accompanying hemoptysis, it must be remembered that active tuberculous, suppurative, or neoplastic disease of the lung may be coexistent. The investigation of the case is not completed, therefore, by the mere recovery of a broncholith.

The varied clinical problems presented by the migration of calculi into the bronchial tree may be illustrated by reports of some of the cases which the author has observed in the Barnes Hospital Chest Service and the Washington University Clinics.

Hemoptysis: In seven cases it has seemed to us reasonably certain that a broncholith was the cause of pulmonary hemorrhage. Positive confirmation was obtained in four instances—once on necropsy examination, twice by bronchoscopic observation of erosion or ulceration of the bronchial wall in proximity to a calculus, and in one operative specimen secured when lobectomy was successfully performed for the control of intractable hemorrhage from the right lower pulmonary lobe. In the other cases calcareous masses were expectorated and careful study failed to reveal any other cause for the bleeding.

"Case 1—L. C., a white woman aged 54, came to the chest clinic in August, 1934, complaining of cough of from four to five years duration, with production of blood streaked sputum. A brother had died of pulmonary tuberculosis in 1919. The physical examination was not remarkable, and tubercle bacilli could not be found in the sputum. A roentgen film of the chest demonstrated an extensive calcified mass occupying the left apex and numerous smaller calcareous foci in both right and left lung fields and in the tracheobronchial lymph nodes. In May, 1935, the patient reappeared stating that she believed gravel had been present in her sputum. In February, 1936, she expectorated a small broncholith during a coughing paroxysm. Since this date, she has reported to the clinic periodically and has given a history of raising more than twenty small stones, many of which have been preserved in our collection. Expulsion of a calculus was usually accompanied by a tearing sensation in the left chest and by

hemoptysis ranging in quantity from slight streaks to a cupful of blood. During a period of observation of over five years, she has gained weight, the sputum has remained free of tubercle bacilli, and there has been no radiologic change except for a diminution in the extent of the calcified mass visualized in the left apex."

This history demonstrates that repeated episodes may be provoked over a protracted period of time by the slow disintegration of a large calcified mass. The preservation of good health is noteworthy, since it must be presumed that the calcium deposits developed in an old tuberculous focus. Although one might expect that the dissolution of the mass would constitute a mechanism for the bronchogenic dissemination of tuberculous disease, the recent observations of Feldman and Baggenstoss¹ seem to indicate that calcified pulmonary foci in the adult seldom contain viable tubercle bacilli. It is obviously important, nevertheless, to subject such individuals to periodic examinations in order to exclude the possibility of subsequent appearance of active tuberculosis.

"Case 2—J. B., a 40 year old white housewife admitted to the hospital in October, 1938, presented a history of hemoptysis occurring at intervals during the preceding seven years. X-ray films taken elsewhere demonstrated that transient atelectasis of the right upper lobe had been present on at least two occasions, five years and one month respectively prior to entry. On admission, physical examination was not remarkable save for suppression of the breath sounds over the upper third of the right thorax posteriorly, and an x-ray of the chest was indeterminate. Bronchoscopy showed granulation tissue about the orifice of the right upper lobe bronchus, and a biopsy taken at this point showed merely a chronic inflammatory reaction. Repetition of bronchoscopy, performed because of failure to demonstrate tubercle bacilli, revealed blood issuing from the right upper lobe. On the thirteenth hospital day, a large hemoptysis occurred, and on the succeeding three days, brisk hemorrhages again ensued. Surgical consultation was requested because of the increasing bleeding which appeared serious in degree and because of the suspicion that a relatively benign type of bronchial tumor was present. Exploratory thoracotomy was per-

formed by incision into the right pleural space, and after complete exposure had been obtained, a large calcified lymph gland could be visualized affixed firmly to the right main bronchus. During the palpation of the structures at the hilum, there was an abrupt change in the patient's condition characterized by cessation of respirations and abrupt decline in blood pressure. Emergency bronchoscopy was immediately performed on the operating table, and it was discovered that the tracheobronchial tree was filled with fresh blood. Despite strenuous efforts to remove the blood, the patient expired as a result of suffocation. Postmortem examination revealed a small calculus, which had apparently come from the hilum lymph gland, wedged in the bronchus to the right upper lobe and eroding into a grossly visible artery in the bronchial wall. The trachea and bronchi contained quantities of blood, but there were no other pathological findings in the thorax."

This case illustrates the seriousness of the hemorrhage which may be associated with intrabronchial calculi. We believe that the operative intervention was a logical procedure despite the unfortunate termination in this instance. Blades and Graham² have apparently saved life in many patients with intractable hemorrhage of undiscoverable etiology through the performance of such major operations without encountering another similar accident. It is possible that preliminary trial of pneumothorax should have been considered, but the necropsy specimen made it appear extremely unlikely that cessation of bleeding would have resulted.

Asthma Syndrome: A broncholith, like any other foreign body, may cause partial or complete obstruction of a bronchus. The resultant clinical picture may simulate that of bronchial asthma or resemble the bronchial stenosis associated with tumor. In the following case, both asthma and neoplasm had been entertained as probable diagnoses.

"Case 3—A. H., a 49 year old white married female employed as a garment maker, entered Barnes Hospital February 8, 1936. She complained of paroxysmal cough, noisy and labored breathing, substernal soreness, and weight loss, the symptoms having existed for a period of five months. The letter from the referring physician in a distant city stated that her illness had at first been regarded

as bronchial asthma because of the characteristic wheezes and groans audible on auscultation of the chest. Failure to demonstrate an allergic background, expectoration of blood tinged sputum, and transient occurrence of an atelectatic collapse of the right lower lobe had subsequently led to a suspicion of bronchiogenic neoplasm. The initial examination revealed a slightly dyspneic patient breathing stertorously. Auscultation demonstrated the typical wheezing rales of bronchospasm over the left hemithorax with an occasional wheeze audible on the right. There was no evidence of lobar atelectasis or any other parenchymal change in the radiogram. Bronchoscopic examination showed generalized reddening of the bronchial mucosa, slight narrowing of the right main bronchus and partial obstruction of the left main bronchus by a foreign body. The foreign body was extracted in three fragments and appeared to be a characteristic broncholith. Immediately following the bronchoscopy, the patient stated that her respiratory symptoms had been completely relieved, and she remained well according to a report received several months later. After the nature of the bronchial obstruction had been disclosed, further questioning revealed that the patient had expectorated a bronchial stone twelve years previously."

Lung Suppuration: The retention of any foreign object in a bronchial lumen is likely to give rise to suppuration in the distal bronchopulmonary segment. Both lung abscess and bronchiectasis have been reported in association with broncholithiasis³. While I have observed the expectoration of gritty particles in several individuals with chronic lung abscess, broncholithiasis has appeared to be the primary pathological lesion in but one personally observed case of pulmonary suppuration.

"Case 4—A. M., a 54 year old farmer, entered the hospital in January, 1940, complaining of weakness, weight loss, cough, night sweats, and repeated hemoptyses during the preceding five weeks. He believed that at least a quart of blood had been raised by cough during a three day period two weeks prior to admission. The temperature was 38° C. by rectum on the initial examination, pulse 80, and respirations 20. No localizing signs could be detected in the thorax, and

the x-ray film was entirely normal except for the presence of a calcified gland at the right hilum. The sputum was repeatedly examined for tubercle bacilli with negative results. Iodized oil instilled into the bronchial tree showed a marked stenosis of the right stem bronchus between the points of origin of the divisions to the middle and upper lobes, the calcified gland lying exactly adjacent to the stricture. Bronchoscopy confirmed the presence of the stenosis and demonstrated a thickened granular mucous membrane at this point; a small amount of pus issued from the bronchus below the constriction. Bronchoscopy was repeated on three subsequent occasions with the object of securing repeated biopsies to eliminate carcinoma and for the purpose of aspirating secretion from the lower lobe to improve the patient's general condition. Although the biopsy specimens showed no evidence of tumor, surgical operation (middle and lower lobe lobectomy) was recommended because it was deemed certain that the patient would have recurrent infection distal to the marked bronchial stenosis. The patient refused operation, which was not strongly urged, and was discharged. Three weeks later he returned, stating that he had expectorated several concretions about the size of a bean one week after leaving the hospital. Subsequently fever had reappeared and he had begun to raise large quantities of purulent sputum. The temperature on entry was 40° C. by rectum, and the examination disclosed signs of atelectasis of the right lower and middle lobes. While in the hospital, the patient coughed up two large soft broncholiths, and another stone was removed by the bronchoscopist. Following elimination of

the calculi, his condition improved, the sputum diminished, and the temperature fell to normal. The bronchial stenosis had persisted, however, and it was anticipated at the time of his second discharge that recurrence of suppuration was inevitable."

The bronchial stricture in this patient appeared to be the most significant anatomical alteration from the standpoint of his future welfare. We believe that this stricture was unquestionably related to the adjacent calcareous lymph node, and the ulceration of calcified portions of this gland through the bronchial wall was chiefly responsible for the suppuration and atelectasis which developed in the right lower lobe.

Summary

Intrapulmonary and intraglandular calcifications may produce disturbance in the occasional instances in which they migrate into a bronchial lumen. The symptoms observed result either from ulceration of the bronchial wall or from the obstruction of the bronchus with attendant atelectasis or pulmonary suppuration. Cases are reported in which hemoptysis, asthma-like symptoms, bronchial stenosis and suppuration were directly associated with bronchial stones.

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Pneumoperitoneum in the Treatment of Pulmonary and Abdominal Tuberculosis

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Pneumoperitoneum, the injecting of gas (oxygen or air) in the peritoneal cavity is not a new procedure. It was used as far back as 1902 for diagnostic purposes. In 1917 we find our first reference in treating intestinal and peritoneal tuberculosis by this method, but it was not used to any great extent until about nine years ago.

Richard H. Overholt, in 1930, proved that by injecting air in the abdominal cavities of dogs the diaphragm could be elevated and partially fixed, thus reducing pulmonary ventilation¹.

In 1931, Andrew L. Banyai reported his results in treating 44 cases of tuberculous enterocolitis at the Muirdale Sanatorium, Wisconsin, by injecting oxygen in the peritoneal cavity. Thirty-one, or 70.4 per cent, of the patients got symptomatic relief. Complete relief was seen in 14, or 31.8 per cent; partial relief of all intestinal symptoms in 10, or 22.7 per cent. The duration of symptomatic relief varied from a few days to two years. He made this observation and comment, "Oxygen increases cell activity in all body tissues, effecting a better local and general immunologic response: Injected oxygen due to its chemical properties and increased intra-abdominal pressure will cause irritation of the peritoneum and intestinal serosa with subsequent hyperemia. A decrease in the peristalsis following oxygen inflations was noted in the majority of our cases. By these accomplishments we are approaching the ideal aimed at in the treatment of any form of tuberculosis, that is, possible maximum immobilization with improved nutrition and immune body supply to the diseased tissues."²

Vajoda of Germany in 1933 considered the improvement of the tuberculous process in pregnant women to be due to the upward movement of the diaphragm. He therefore tried to produce this condition artificially by injecting air in the peritoneal cavity. He tried it on two patients. In the first he injected 1200 cc's of air; and in the second, 700 cc's.

No complications developed and the functions of the abdominal organs were not impaired. The diaphragm was forced up to the extent one would get in a very successful phrenic operation. He considered this form of therapy useful in prolonged pulmonary hemorrhage that could not be controlled by other methods.³

Banyai, in March, 1939, reports 91 cases of pulmonary tuberculosis treated with pneumoperitoneum. He states that a continuous intraperitoneal pressure is capable of and does therapeutically relax a tuberculous lung.²

Trimble, Eaton and Moore, in April, 1939, reported 152 cases of pulmonary tuberculosis treated by injecting air in the peritoneal cavity. Twenty of these cases came to autopsy. The term of treatment varied from one to thirty-three months. Fifteen, or 75 per cent showed no specific local effects on the peritoneum; two showed definite inflammatory changes. In none of these did he consider that the form of treatment had any relation either directly or indirectly to the cause of death. One case died of tuberculous peritonitis. One would expect that in a group of 152 cases anyway, no matter what form of treatment was instituted.⁴ Many articles have appeared in the literature in the past three years, too numerous to mention.

At the Tidewater Memorial Hospital we have fifty patients, the majority of them far-advanced. About fifteen of them are getting pneumothorax, the remainder only rest in bed and symptomatic treatment. I felt that we should at least attempt to do something for these poor, bedridden, unfortunate individuals that were just lying there waiting for the worst to come.

Dr. A. Steiner was our resident physician at that time. I took him two articles to read and told him I was going to try pneumoperitoneum on a few to see how they got along. We selected as our indications, (1) Bilateral pulmonary tuberculosis that had not responded to other forms of treatment, such as pneumothorax and other forms of collapse therapy; (2) Bilateral pulmonary tu-

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berculosis cases that were too sick for any other form of collapse therapy; (3) Pulmonary hemorrhage that could not be contracted by other methods; (4) Tuberculous enteritis and peritonitis; (5) Intestinal hemorrhage.

Report of Cases

To date we have used this form of therapy on 12 patients. The first, J. G., was a white male, age 33, who had bilateral pulmonary tuberculosis with severe abdominal and genito-urinary symptoms. He had been sick since 1937. Pneumoperitoneum was started November 15, 1938 for severe abdominal cramps. It was continued until December 9, 1938, when he left the sanatorium with some relief of abdominal symptoms.

Case 2—J. M. S., white, male, age 29, had been sick since November 1930. He was in Blue Ridge Sanatorium eighteen months. He then worked two years as a clerk. In November 1935, he had a spontaneous pneumothorax on the right side with pleural effusion. He was in a General Hospital five weeks, then was transferred to Catawba Sanatorium in December 1935, where he remained until August 1938. In the meantime the disease had spread to the contralateral lung and multiple cavities had developed in both lungs, the larger being in the left lung. Pneumothorax had been attempted with no success. Thoracoplasty had been advised for the left side as soon as the right lung had healed sufficiently to stand the operation. He entered Tidewater Memorial Hospital November 18, 1938 with active bilateral tuberculosis, multiple cavities, the one on the left about the size of a lemon, sputum positive, raising from one to three ounces a day. He was started on pneumoperitoneum on January 27, 1939, taking around 1200 cc's of air a week, given in two injections in the beginning. His cough improved, the quantity of sputum increased at first, then reduced considerably. He has shown marked improvement in many respects. Cavities on the right have closed, the one on the left reduced in size. The diaphragm had been elevated to about the fourth rib front, and seventh back. On October 13, 1939 we had a temporary phrenic done on the left, endeavoring to fix the diaphragm at this point. The patient is still under treatment, getting one refill a week of 700 to 1000 cc's each time, this being quite a large man. Sputum is negative.

Case 3—J. R. M., white, male, age 33, clerk, stopped work August 1938, having dropped from 120 to 97 pounds in weight. He entered Tidewater Memorial Hospital September 13, 1938 with bilateral pulmonary tuberculosis involving the greater portion of both lungs. This man was critically ill. He was thought too sick to consider any form of collapse therapy. Soon after entering the hospital he developed abdominal symptoms, very suggestive of tuberculous enterocolitis. His appetite and digestion failed; he had severe cramps, with six to twelve loose bloody stools a day. His hemoglobin dropped to 55 per cent. In December, 1938, he was transferred to Norfolk General Hospital. He was given two transfusions, external sphincter cut to relieve him of his constant tenseness. He got some relief from this, but continued to have digestive disturbances, abdominal cramps and many loose bloody stools each day. In the meantime he had developed small cavities in both lungs with profuse expectoration. On February 14, 1939, I started pneumoperitoneum, giving 500 cc's a week. He was also put on Vitamin B Compound with Iron diet. His sputum was soon reduced, abdominal symptoms improved, bowel movements reduced to one and two well formed stools a day, temperature returned to normal, but he was never able to put on much weight. An x-ray picture made November 6, 1939, shows cavity on right closed, much fibrosis and clearing of right lung, upper half of left about the same. Diaphragm elevated to about the fifth rib in front. He is still under treatment, taking 500 cc's of air once a week. Pneumoperitoneum changed this progressive, critically ill man into a comfortable and slowly improving patient. His sputum is still positive.

Case 4—D. L. M., age 43, white, male, entered Tidewater Memorial Hospital January 1, 1939. He had bilateral pulmonary tuberculosis with a positive sputum. Wasserman was four plus and a rather severe form of diabetes mellitus was present. He was immediately put on Anti-Leutic treatment and a diabetic diet and Insulin. During February, he developed a large abscess in the hip following an injection of Bismuth with sloughing. Whether this was due to the Bismuth or the diabetics we were unable to determine. As

a result of this complication he came near dying. An x-ray picture made a little later showed a large cavity in the lower lobe of the right lung and a good deal of softening in the left. Pneumoperitoneum was started May 5, 1939. A picture made June 6, 1939 showed the cavity almost obliterated. In September, the patient began to complain of severe abdominal pain, loss of appetite and was rapidly going downhill. Abdomen was very tense. Under the fluoroscope the diaphragm was seen at the 6th rib. We concluded that he was too tight and stopped his treatment on September 11. His appetite returned and he began to improve. Refills were resumed on October 24, 1939 and he is still under treatment. An x-ray made November 18, 1939 showed diaphragm at 4th rib front and 7th rib back. The left lung was much clearer. Cavity on the right, which had reopened, pushed up and near the hilus. Sputum was negative.

Case 5—M. B., colored, female, bilateral tuberculosis with a cavity, was critically ill. Pneumoperitoneum was started May 5, 1939, stopped June 3. There was no improvement, and the patient died a few days later.

Case 6—T. L., age 21, white female, had a large cavity in the lower lobe of the right lung, and positive sputum. Pneumothorax was induced, but we were unable to close cavity because of multiple adhesions. In December, pneumolysis was attempted with only partial success. The patient developed empyema with a spread of the tuberculous lesion to the contralateral lung. She then developed abdominal symptoms very suggestive of tuberculous enteritis. Pneumoperitoneum was started March 4, 1939. She got slight relief from her abdominal symptoms, but continued to go downhill and died May 19, 1939.

Case 7—A. C., age 21, white, female, had been quite sick for a long time, right lung being bound by thickened pleura following pneumothorax and empyema over half of left lung, infiltrated and having a large cavity. Pneumoperitoneum was started May 5, 1939. The patient soon began to show toxic symptoms. I advised discontinuing the treatment, which was done on May 26, three weeks after it was started. This was the only case where I thought the treatment definitely made the patient worse. She had very little normal lung tissue to begin with. By com-

pression, this was greatly impaired, producing anoxemia. The girl picked up after the air was absorbed and returned home. I understand that she is still alive.

Case 8—J. Z., white, male, age 44, entered the hospital on March 3, 1939, with the greater portion of both lungs involved, raising about eight ounces of positive sputum a day. Wasserman four plus. He was put on Anti-Luetic treatment and bed rest, but continued to go downhill. He developed severe abdominal symptoms, cramps and diarrhea. X-ray of tract did not give any definite information. We concluded that he had tuberculous enteritis and started pneumoperitoneum on August 8, with slight improvement of his abdominal symptoms. X-ray of his chest made October 30, 1939, showed some improvement over films made in February, with diaphragm elevated to the fifth rib. Patient is still under treatment and holding his own.

Case 9—T. J., white, male, had tuberculosis for several years. This was far advanced, with large cavity in upper left. He hemorrhaged about six ounces on November 14. On November 16 he was given 525 cc's of air with a plus eight reading; November 8, 600 cc's with a plus eight reading. No more bleeding was present and treatments were continued. He hemorrhaged November 30, 1939.

Case 10—H. B. S., white, male, age 22. This man had a far advanced bilateral case with large cavity. On November 14, 1939, he hemorrhaged about 16 ounces. On November 15, 500 cc's of air were injected in peritoneal cavity. November 16 he hemorrhaged 24 ounces. November 17 we gave him 1000 cc's of air; November 18 he hemorrhaged 30 ounces and died.

Case 11—S., was a colored male, bilateral case with cavity. On November 23, 1939 he coughed up about 15 ounces of blood. On November 24, 750 cc's of air were injected in peritoneal cavity; on November 25, 550 cc's. On November 27 he had another hemorrhage of five ounces. We gave 1000 cc's of air in peritoneal cavity. On the same day, at 3:30, he hemorrhaged 10 ounces. At midnight of the same day, he raised 10 ounces more. On the following morning, Dr. Ray attempted to collapse the left lung, gave 500 cc's of air. At 7 p. m., he raised 3 ounces; and at 1 a. m., 4 ounces. On November 29 another 150 cc's of air were injected in left pleural space and

at 10 a. m. he raised 8 ounces of blood. This man was also getting all of the routine treatments for controlling pulmonary hemorrhage, of which none were of any avail.*

Case 12—F. D., was colored, female, age 23. She was a very far advanced bilateral case, raising about 16 ounces of sputum in 24 hours, positive for tubercle bacilli. She was taken sick in May 1939, and her normal weight of 125 pounds, dropped to 89 pounds. Hemoglobin 52 per cent, R. B. C. 3,280,000 and sedimentation rate of 32. The patient was rapidly going downhill, so I advised pneumoperitoneum. On November 18, 1939, no breakfast. At 8:45 she was given Morphine gr. $\frac{1}{4}$, Atropine gr. $\frac{1}{150}$ by hypo. At 9:30 pneumoperitoneum was attempted. The needle entered easily, no blood came from the needle, 25 cc's of air injected, then 50 cc's and 100 cc's. The manometer changed only two points, 200 cc's more were given. At this time, patient went into collapse, pulse weak and thready. Adrenalin was administered; she had an involuntary movement of the bowels and bladder, died in five to ten minutes, cause not determined.

Discussion

The technique for this operation has been described numbers of times in the literature. We only wish to mention that it is necessary to carry out strict asepsis, and use a blunt needle so as to avoid all danger of puncturing the abdominal viscera. We usually make our puncture in the upper left quadrant near the costal border with the patient leaning to the right side. There is very little discomfort, sometimes present, and if they are following the injection. A sensation of full-

* The hemorrhage cases finally came under control and are doing very well, with the exception of a negro patient, case number eleven, whose disease is spreading.

made very tight, pressure up against the diaphragm produces some pain in both shoulders. As a rule they are not able to take quite as much food with each feeding, and it is best to give nourishment between meals. The manometer as a rule oscillates very slightly with the first injection, but with subsequent refills, as the patient becomes tense, you get a positive pressure from plus five to plus ten.

One might ask, are you justified in attempting a treatment, the value of which has not been definitely proven. In selected cases we think so. The chronic bedridden case that has failed to respond to the routine treatment should be given the benefit of anything that offers him a ray of hope for improvement and relief. Three of our cases, or 25 per cent, were definitely benefited, both symptomatically and clinically, and are still improving. One hemorrhage thus far has been controlled, the other two not benefited. One case was made temporarily worse and one died as the result of the treatment. The remaining five showed very little if any change.

We fully realize this is a small series of cases to report. We also realize that in order to give proper evaluation to any form of therapy it is necessary to report failures as well as successes.

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Discussion

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It is alike a privilege and a pleasure to be able to speak on this paper of Dr. Harrell's on Pneumoperitoneum.

Pneumoperitoneum is used in pulmonary tuberculosis and in the abdominal forms of

tuberculosis as well. In tuberculous peritonitis it is an academic and orthodox procedure. In intestinal tuberculosis it has been frequently used; the air within the peritoneal cavity causes an inhibition of the nerve influence, thereby decreasing the intestinal spasm in most cases and the patient is ac-

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cordingly made more comfortable. The pneumoperitoneum apparently brings about only a symptomatic improvement in the enteric and the enterocolonic tuberculosis as most pathologists have found no difference in intestinal tuberculosis in those cases treated with pneumoperitoneum and those not so treated.

In the treatment of pulmonary tuberculosis, pneumoperitoneum is a rather recent form of therapy, and while it will not supplant any of our present forms of active therapy, there are certain indications for its use when phrenic paresis, pneumothorax, thoracoplasty, etc., are either contraindicated or unsuccessful. While this procedure is going through this trial stage, as all new procedures must, it is wise to bear in mind certain indications for its use.

First: In cases of advanced bilateral disease in which the low vital capacity prevents any other form of bilateral collapse. In a good percentage of these cases the pneumoperitoneum will be accompanied by definite improvement in the disease and often as much improvement on one of the sides as to enable the operator to carry out a more energetic procedure on the opposite side. I think Dr. Harrell's cases well represent this indication.

Second: In cases of unilateral disease with cavitation in which pneumothorax has failed. While a thoracoplasty will be necessary on most of these cases, pneumoperitoneum will close a number large enough to warrant its trial for several months before thoracoplasty is undertaken and while thoracoplasty would be contraindicated.

Third: In basal lesions with or without cavitation where a phrenic paralysis is indicated, pneumoperitoneum may be used, but in such cases the pulmonary lesion should be watched closely and pneumothorax should be attempted in case the disease fails to respond. But I must confess that my own limited experience dictates that the best form of treatment in basal lesions is a phrenic reinforced by a pneumoperitoneum, holding pneumothorax or thoracoplasty in reserve. We have in the hospital now a case which

illustrates this viewpoint. We have a colored woman, 28 years of age with large basal cavity; pneumothorax was instituted with a fair collapse, and the only result so far, is an increase in the size of the cavity and a spread into the contralateral lung. We are attempting to correct our blunder by having a phrenic and later on, expect to start pneumoperitoneum. We feel this will save this woman from a thoracoplasty which will take all the ribs on her diseased side.

Fourth: In cases of pulmonary hemorrhage in which the side responsible for the hemorrhage cannot be determined, or when the side responsible may be determined, but pneumothorax is unsuccessful. We have in the hospital two cases now treated by pneumoperitoneum which illustrate these indications. One, a man transferred from Blue Ridge, age 45, to await a suitable time for thoracoplasty, immediately after his admission began to bleed; we were uncertain from which side the blood was coming, as both lungs were greatly involved, pneumothorax having been attempted and abandoned in both sides. After bleeding some days with no other procedure possible, we instituted pneumoperitoneum. He has bled only one day since starting this treatment. The other case is an unilateral case of long standing, age 52 years, with history of frequent small hemorrhages. Soon after admission we attempted pneumothorax which failed to collapse the diseased areas and bleeding continued. We then had a phrenic done within 30 days, and the largest hemorrhage of her lifetime occurred. We at once instituted pneumoperitoneum and the bleeding so far has not been resumed. She is still under treatment.

Fifth: In cases of phrenic paresis, where compression is inadequate, reinforcement with pneumoperitoneum may aid in the better compression. Truly we believe pneumoperitoneum is the handmaid of the phrenic.

All of these indications have been dwelt upon in this paper of Dr. Harrell's and what I have had to say is but a feeble repetition of the indications of pneumoperitoneum as set forth in this most excellent evaluation of the procedure. I thank you.

Sanatorium Treatment of Tuberculosis

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The primary function of a sanatorium is the one fundamental and first in the activities of any hospital, namely, care of the sick, and in this instance, the attempt to obtain an arrest and cure of tuberculosis. Whether an arrest of the disease will occur depends on many factors, such as age, sex, race, occupation, and complications, but particularly on the stage of the disease. In spite of the repeated emphasis of the fact that the chances for recovery and a good prognosis in pulmonary tuberculosis depend on the extent and degree of lung involvement at the start of treatment, the number of patients that begin treatment with far advanced disease is tremendously high. At the present time, 75 to 85 per cent of the admissions to the sanatoria and tuberculosis hospitals of this country are in a far advanced stage. Our experience has indicated that treatment of a sanatorium group of patients with 85 per cent showing minimal or moderately advanced lesions (minimal 35—40%, moderately advanced 45—50%), will result at the time of discharge with 85 per cent in a condition graded from improved to arrested and close to 50 per cent in the latter category.

Thus the efficacy of sanatorium treatment depends in a great measure on the early diagnosis and reference of the patients. All health efforts to find, isolate and treat pulmonary tuberculosis in an early stage are not only justified but necessary. It is especially the general practitioner who should seriously accept the slogan "Find and treat tuberculosis early," for he is the individual who often makes the first contact with the patient. Proper recommendations by him at that time will frequently determine the eventual outcome of the disease.

Follow-up studies of discharged cases have indicated that the permanency of a satisfactory physical condition (with a stationary or retrogressive lesion, negative sputum, slight or no symptoms, and return to work or normal environment) depends directly on the stage of the disease with the best results in the minimal group and the highest unsatisfactory percentage (with progression of the

lesion, positive sputum, symptoms, need of hospitalization, or failure to return to normal environment) in the far advanced stage. Moreover, the importance and necessity of uninterrupted sanatorium care until the condition becomes arrested has been further evidenced by the follow-up observations that: (1) The closer the physical status on discharge approaches a condition of complete arrest, the greater the probability of continuation of a satisfactory condition after hospitalization; (2) the percentage of good results is less for those patients who leave the institution against advice; and (3) arrested cases form a majority of those patients, who after discharge are able to return to a gainful occupation or are in condition to work.

The next great function of the sanatorium is its service as an educational medium for the patients. In the teaching of new health habits and demonstration of proper modes of living, the sanatorium instructs patients not only how to care for their own health, but how to live with and protect others. The patients receive both didactic and practical instruction. The didactic training is covered by lectures, the content of which is briefly outlined as follows:

The functions of the sanatorium (i.e., for treatment, removal of positive cases and education of patients) are explained.

Items in a book of rules and regulations given each patient are discussed with constant emphasis on the need of the patients' cooperation to get the best results of sanatorium treatment. This booklet contains not only rules of conduct and sanatorium regulations, but items of a general nature and their influence on tuberculosis, such as rest, fresh air, heliotherapy, food, tobacco, etc., and instructions and suggestions for the patients in relation to these factors.

The manner of spread of tuberculosis is explained and the many methods responsible, such as coughing, sneezing, spitting, kissing, contamination of utensils, body discharges, etc., are expounded upon. The viability of the tubercle bacillus in sputum droplets and dust particles, under conditions of drying and

freezing, and poor light and ventilation and its death by sterilization, sun and fresh air, is discussed. All of these items are commented on in relation to the patient and his hospital activities and also to the home environment that is to follow.

The prophylaxis of tuberculosis is emphasized and proper personal hygiene is explained. This includes care of the hands, (particularly after every possible contact with infectious material), mouth hygiene, and the use of gauze or paper napkins and sputum cups. This instruction is important as the patients learn how to prevent spread of infection to other people and how to maintain scrupulous personal cleanliness.

The fundamental requirement of rest and good food and fresh air in the treatment of tuberculosis is stressed. Particular emphasis is placed on the efficacy of rest, and the meaning of true medical rest and the sanatorium rest hours are explained. Thus patients learn that complete rest is unobtainable with any degree of physical activity or mental stimulation, and talking, reading, writing, radio playing, are not allowed during rest periods. A proper mental outlook is important and an atmosphere of cheerfulness, a spirit of contentment and a feeling of hopefulness are engendered.

The indications and mode of action of the various surgical adjuncts of collapse therapy are explained so that the patients will cooperate with the physician and understand the needs for these various measures.

Readmissions to tuberculosis institutions average between 15 and 20 per cent. Special discharge advice is given patients because it must be strongly impressed on them that there are causative factors for relapse and readmission that can be avoided and prevented.

This advice includes,*

1. Personal hygiene (sputum, dishes, hands, bed linen, kissing, contact at home).
2. Continuation of habits of institution. (Rest hours, good room, proper ventilation, temperature and sunshine).
3. Weight and temperature checked regularly.

4. Continuation of care by physician or in clinic.

5. Additional activity should be added slowly, and only by the instruction of a physician.

6. The return to a former or new occupation should be guided by a physician.

7. Avoidance of excess alcohol, tobacco, fatigue and loss of sleep.

8. Emphasis on need of continued frequent routine examinations, especially periodic x-rays and sputum examinations, as the patient's progress must not be judged by symptoms.

9. If pneumothorax is present at time of discharge it is to be continued, and discontinued only on the advice of a physician.

10. Inciting causes of tuberculosis are to be avoided (fatigue, worry, excesses, colds, poor food, contact with tuberculous persons).

11. Immediate check with the occurrence of any symptoms of relapse (fatigue, loss of weight, increase in expectoration, or cough, temperature, indigestion, streaking, chest pains or shortness of breath).

The patients procure practical training by actually living the regime outlined in the lectures with help and advice from the physicians and nurses. These activities become good habits, almost automatic reactions, that enable the patients to pattern their lives at home and at all times, according to the routine learned in the sanatorium. They become safe tuberculous patients from the standpoint of spread of infection, and moreover, countless numbers of relapses have been avoided by the patients living according to the sanatorium education.

The treatment of tuberculosis is not complete until the patient is free of all active disease and in a satisfactory economic situation, and thus the need for rehabilitation. Rehabilitation represents activity, either physical or mental, that not only aids in the recovery from tuberculosis, but also assists in the adjustment of the individual to a new economic status. It involves a gradual increase in exercise and work by the patient and is ergo therapy.

Rehabilitation covers a multitude of forms and needs, and includes many subjects, such as commercial (stenography, clerical, typewriting); various arts and crafts (printing, bookbinding, photography, wood, metal and leather work, carpet making, reed weaving)

* From "A Study of Readmissions to Sea View Hospital," *Quarterly Bulletin of Sea View Hospital*, Vol. 3, No. 3, April, 1938, Drs. I. D. Bobrowitz and Jerome L. Leon.

and miscellaneous occupations like laboratory technician, barber, tailor, gardener and farmer.

The general plan in associating patients with rehabilitation is to grade the patients' physical activity, and in this manner the work is constantly under the direction of the physician. The occupational therapist guides the choice of work by consideration of the educational background of the patient, previous work experience, mental attitude, occupational inclinations and interest and manual dexterity. In more complete programs, a very thorough aptitude test is done to determine the occupation the patient is best suited for. In this a psychologist aids the therapist.

As the patients continue to improve, the activity and time allowed for occupational therapy is gradually increased so that on discharge, they are performing the equivalent of four or more hours work a day.

The desirability of rehabilitation is emphasized by the fact that tuberculous patients are young enough, well enough and intelligent enough to receive skilled training, and there is a particular need for teaching new vocations. To aid in the return to industry, sanatoria are associated with welfare employment agencies, state job placement bureaus or sheltered work shops.

Although the work taught in a sanatorium may not always be of a type directly applicable by the patient for return to an outside occupation, all work performed is definitely useful because it aids and speeds recovery, improves the physical condition of the patient, serves as a hardening process, provides mental stimulation, promotes individual contentment and actually teaches new skills.

We have presented the actual phases of treatment of tuberculosis in a sanatorium, and yet this subject is not complete without mention of the other functions of the sanatorium:

1. Public health duties.

- (a) The hospitalization of open cases.
 - (b) Public education.
 - (c) Case finding.
 - (d) Cooperation with health agencies and follow-up studies.
2. As a center for diagnosis (laboratory work and consultation in tuberculosis and chest diseases).
 3. Clinical and laboratory investigation in tuberculosis and chest diseases.
 4. Scientific teaching and education for medical students, nurses, dietitians, resident staff and visiting staff.
 5. The work of the Social Service Department in properly adjusting the patient and helping the procurement of a permanent cure by various aids while in the sanatorium and proper reference and advice on discharge.

The activities of the general practitioner are closely related to the sanatorium in many ways. The sanatorium offers him a consultation service and assists in caring for his tuberculous patients. The private physician should impress on his patients the need and value of sanatorium care and the necessity of treatment until discharge occurs as arrested. Collaboration with the sanatorium is essential in order for him to (1) carry out discharge instructions given to the patients; (2) provide frequent x-ray and sputa examinations; (3) aid in the economic and social improvement of the patient; (4) and guide any increase in the patients' physical activity or return to a vocation, or needed change of treatment.

The early diagnosis of tuberculosis is very often the responsibility of the general practitioner and in this lies the most important relation of the physician to the sanatorium, for the success of sanatorium treatment depends particularly on this early diagnosis for with the consequent isolation, treatment and education of the patient, we have our most potent means of reducing the morbidity and mortality of tuberculosis.

Municipal Sanatorium.

Review of Monograph

PNEUMOCONIOSIS (Silicosis) — The Story of Dusty Lungs by Lewis Gregory Cole and William Gregory Cole, John B. Pierce Foundation, New York City, 1940.

The monograph on silicosis deals with the etiology, pathogenesis, anatomy, pathology, roentgenology, clinical, social and economic problems, legislation, and adjudication.

The authors divide the dust particles which cause the condition into non-refracting and refracting elements. The former are large or small opaque flecks best observed under the light field of the microscope while the latter are large or small translucent or opaque bodies and seen effectively under the dark field. The refracting bodies are silica and hematin crystals. The non-refracting elements are jet black or reddish brown or brown flecks or carbon. There is a description of the technique for examining the dust particles.

Pneumoconiosis is divided into four types: The first type has peribronchial and perivascular lymph node manifestations. The second is a nodular type in which hard shotty silicotic nodules are present symmetrically in both lungs. The third is the "pock-marking" type with pneumoconiotic cysts which are usually regarded as emphysematous blebs. The fourth type is acute silicosis and according to the authors it is the most important type because of the seriousness of the lesion. The lung resembles that of partially resolved pneumonia with only slight accentuation of the peri-

bronchial and perivascular structures. Microscopic examination shows anemic areas with collagen deposits, compression of the capillaries and hyperemic areas with marked congestion. So-called silicotic nodules may be difficult to find.

The roentgen-ray features in pneumoconiosis are accentuated hilar and linear markings in type I, small, clear-cut, well defined white spots in type II, small black spots, surrounded by white rings (pock-marks) in type III and a general haze or cloudiness in type IV. The special roentgen findings are "pawnbroker's sign," "angel wings" and "split pleura".

Regarding the social and economic aspects of pneumoconiosis, the authors discuss the laws governing the compensation of victims of silicosis and it is their belief that ninety per cent of the cases recognized as silicosis are not compensable. The individuals having acute silicosis and type III silicosis are compensable.

This monograph is an informative review of the present knowledge of silicosis. A discussion of the authors' experience in some of the complications of silicosis such as tuberculosis and heart disease would have been interesting. Their suggestion for better co-operation between the laborer and the employer for solution of the problem of silicosis is well taken.

F. W. B.

Organization News

DR. JOSEPH A. LANGBORD
2112 Pine Street
Philadelphia

"July 26, 1940.

"Dr. Frank Walton Burge,
1930 Chestnut Street,
Phila., Pa.

"My dear Frank:

"I want to take this occasion to write and tell you how much I enjoyed our convention. It certainly functioned in a dignified manner. The papers were scientific, instructive and attractive. Every phase, such as the luncheons and the banquets, kept pace with the scien-

tific program. On my departure therefrom, I felt that I was much enriched with information that would serve me in my routine work.

"At this time, I want to learn from you what steps the association will take insofar as the Medical Preparedness work is concerned in our city. I forwarded my questionnaire volunteering my services. However, if you will in any way participate in organizing the work in our community, I want to offer you the services and facilities of our clinic which is fully equipped to carry out the work that the government may require.

"I served in the last war in the capacity
(Continued to page 282)

POST INFLUENZAL SEQUELAE—SPECIAL REFERENCE TO LUNGS

DAVID TOWNSEND, M.D., F.A.C.C.P.*
Bristol, Tennessee

A paper under this title was read in Tennessee and submitted for publication. While we cannot at this time present it in full, due to the number of papers awaiting publication, we would like to emphasize the importance of certain points to which Colonel Townsend has called attention.

He notes the close similarity in symptoms and signs which exists between patients with chronic fibroid tuberculosis and those who have suffered from influenza complicated by severe bronchitis, pulmonitis with fibrosis, bronchiectasis and loculated insufficiently drained empyemata. He cites also the frequency of chronic infection of the sinuses.

A frequent result of influenza is the "neuro-circulatory-asthenia" syndrome with marked

dyspnea and rapid heart action occasioned by even slight exertion. These patients are unable to "perform continued mental or physical labor."

In short, the pulmonary and bronchial changes resulting from complicated influenza may bear a close resemblance to those of fibroid tuberculosis, while the toxic manifestations of the chronic infection of sinuses, empyema, etc., may simulate the toxemia of the active phases of tuberculosis, and the functional disturbances resulting in cardiac and respiratory disturbances should also be appreciated.

Colonel Townsend also calls attention to the fact that an apparently mild attack of influenza may have serious sequelae, while a severe primary attack may clear with no remaining disability.

F. W. B.

* Member, State Advisory Committee on Tuberculosis, Tennessee.

Organization News

(Continued from page 281)

of chief examiner of my district and if my experience counts for anything, I shall be only too happy to render my services as well as the services of all of my men working with me at the clinic and sanatorium.

"Truly yours,

JAL:K

"Joseph A. Langbord, M.D."

COMMITTEE ON MILITARY AFFAIRS

The Committee on Military Affairs wishes to announce that over three hundred questionnaires have been returned and asks that those Fellows of the College who have not as yet sent in their questionnaires, complete them and place them in the mail without delay.

MEETING AT ROCKY GLEN SANATORIUM

On June 20th, the Eighth District Ohio State Medical Association met at Rocky Glen Sanatorium, McConnellsville, Ohio. Among those on the program was Dr. Chevalier L. Jackson of Philadelphia, Pennsylvania, a Fellow of the College. Other Fellows of the Col-

lege present were Dr. A. A. Tombaugh of McConnellsville, who was elected President of the Eighth District Society; Dr. Joseph Placak, Cleveland, Ohio, Regent of the College for District Number 5; and Dr. Louis Mark, Governor for the College of the State of Ohio and Medical Director of Rocky Glen Sanatorium.

REPORT OF THE SECTION ON TUBERCULOSIS OF THE PHILADELPHIA COUNTY MEDICAL SOCIETY

Seven meetings of the Section on Tuberculosis were held during the 1939-1940 Season, with a total attendance of 560. The meetings were held for general practitioners to increase their interest in tuberculosis, particularly in regard to early diagnosis and modern treatment. The meetings were conducted in a manner off the beaten track of the usual scientific gatherings. Written questions from those present were passed up to the Chairman, Doctor Burge, who read them aloud and had them answered by the "ex-

(Continued to page 284)

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MODERATE RATES

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Ralph C. Matson, M.D., & Marr Bisaillon, M.D.

1004 Stevens Building

Portland, Oregon

(Continued from page 282)

perts" present. Beer was imbibed in moderation during the discussions and afterward an enjoyable repast was partaken of.

The success of the Section was undoubtedly due to the excellent cooperation of all the important chest groups in Philadelphia. The meetings will be continued next winter, with perhaps some modifications that are being studied.

Among the speakers who were especially qualified to impart useful information and instruction to the general practitioners present were: Doctors Esmond R. Long, Eugene Pendergrass, William Lampe, Howard Marcy (Pittsburgh), Gabriel Tucker, Joseph W. Post, William Devitt (Devitt's Camp), Howard Bradshaw, Frank Walton Burge, Richard Meade, Jacob Crellin, Robert G. Torrey, Seth Brumm, George G. Ornstein (New York), A. J. Cohen, John T. Farrell, Chevalier L. Jackson, Edward L. Bortz, W. Emory Burnett, Francis F. Borzell, Frederick D. Stubbs, Nathan Blumberg, Louis H. Clerf, Severe F. Madonna, John L. Reeves, Charles L. Brown, Hobart A. Reimann, and Thomas F. O'Leary.

ALEX. HERON DAVISSON, M.D.,

Philadelphia, Pennsylvania.

REGENT REPORTS

Dr. Moses J. Stone, Boston, Massachusetts, Regent of the College for District Number 1, reports on a fine series of papers on Chest Diseases presented at the Meeting of the Massachusetts Medical Society held in Boston during the week of May 19th. He further reports, that the Trudeau Society of Boston, an independent organization having no connection with the American Trudeau Society, has recently raised a fund for a lectureship, which is to be known as the John B. Hawes Lectureship and is to be given under the auspices of the Trudeau Society of Boston, during the winter meeting of the Society. Dr. Hawes was a former Fellow of the College.

DR. RALPH MATSON REPORTS

Dr. Ralph C. Matson, ex-president of the College and Chief Surgeon and Chief Medical Consultant of the University State Tuberculosis Hospital, Portland, Oregon, reports that John W. Stacey, a Fellow of the College, has completed a year of service at the Hospital

as Assistant Medical Director and will open private offices in Arizona. Dr. James S. Conant, another Fellow of the College, has advanced to assume the position of Assistant Medical Director, vacated by Dr. Stacey, and has also become a Fellow in Thoracic Surgery. Dr. William A. Conklin, a third Fellow of the College, becomes Resident in Thoracic Surgery.

FELLOW APPOINTED TO BOARD OF HEALTH

Dr. Francis Marion Pottenger, Monrovia, California, a Fellow of the College, has been appointed a member of the California State Board of Health.

FELLOWS APPOINTED TO MEDICAL SOCIETY TUBERCULOSIS COMMITTEE

Dr. Daniel L. Borden, President of the District of Columbia Medical Society, recently appointed the new Tuberculosis Committee of the Society for the year ending July 31, 1941.

Dr. J. Winthrop Peabody, the retiring chairman, will remain as a member of the new committee. The committee is composed of the following men: W. Ross Morris, M.D. Chairman; Wm. Davis Tewksbury, M.D., Vice-Chairman; J. Winthrop Peabody, M.D.; James A. Wissler, M.D.; A. Barklie Coulter, M.D.; and Nicholas A. Mandelos, M.D.

Dr. Peabody is First Vice-President of the College; Dr. Tewksbury is Governor of the District of Columbia for the College; and Dr. Mandelos is a Fellow of the College.

FELLOWS APPOINTED TO IOWA TUBERCULOSIS COMMITTEE

Among the five members of the Tuberculosis Committee of the Iowa Medical Society are the following Fellows of the College: Dr. Jesse C. Painter, Dubuque, Chairman of the Committee and Governor of the State of Iowa for the College; and Dr. John Russell of Des Moines.

MEXICAN SOCIETY HONORS FELLOWS OF THE COLLEGE

La Sociedad Mexicana de Estudios Sobre Tuberculosis, Mexico, D. F., has elected Dr. (Continued to page 286)

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E. W. HAYES, M.D., Medical Director

(Continued from page 284)

Benjamin Goldberg, President-elect of the College, and Dr. Ralph C. Matson, ex-President of the College, to Honorary Membership, in appreciation of their work and scientific standing.

NOTICES

Dr. Arnold Shamaskin, Medical Superintendent of Montefiore Sanatorium at Bedford Hills, New York, for the past twelve years, is now with the Veterans Adminis-

tration and is stationed at the United States Veterans Facility at Oteen, North Carolina. Dr. Shamaskin has been a Fellow of the American College of Chest Physicians since its inception.

Dr. Giles Wolverton, Fellow of the College, announces the opening of offices at 804 Fidelity Building, Dayton, Ohio. Dr. Wolverton was formerly Assistant to the Medical Superintendent of Stillwater Sanatorium and his private practice will now be limited to respiratory diseases.

A v a i l a b l e

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